



PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : F42B 14/02	A1	(11) International Publication Number: WO 96/12927 (43) International Publication Date: 2 May 1996 (02.05.96)
(21) International Application Number: PCT/SE95/01179 (22) International Filing Date: 13 October 1995 (13.10.95) (30) Priority Data: 9403570-6 19 October 1994 (19.10.94) SE (71) Applicant (for all designated States except US): BOFORS AB [SE/SE]; S-691 80 Karlskoga (SE). (72) Inventor; and (75) Inventor/Applicant (for US only): GUSTAVSSON, Lennart [SE/SE]; Systerstigen 15, S-691 44 Karlskoga (SE). (74) Agent: FALK, Bengt; Bofors AB, Patents and Trademarks, S-691 80 Karlskoga (SE).	(81) Designated States: CA, JP, NO, SG, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments. RTMP copy	
(54) Title: SKIDDING DRIVING BAND (57) Abstract The present invention relates to a method for providing K-E ammunition, such as sub-calibre arrow-type projectiles (2), with skidding plastics driving bands (11) acting as barrel seals, by virtue of the fact that the driving bands, before being fitted, are provided with at least one cut (13) running through their casing surface, which cut (13) makes it easier for the driving band to be fitted into a specifically designed groove (8). The invention also includes the finished driving band.		

Case 3521

Skidding driving band

The present invention relates to a novel method for providing K-E ammunition, such as sub-calibre arrow-type projectiles provided with sabots, with plastics driving bands of a type which is known per se, which plastics driving bands, upon firing from specifically designed barrels, seal against the inner side of the barrel and skid into a specifically matched groove in the sabot of the projectile.

The invention also includes the plastics driving band which is configured in accordance therewith.

The proposal to use plastics driving bands at all as barrel seals in respect of different types of ammunition dates back a long way, although it was primarily full-calibre projectiles with plastics driving bands which were originally in mind. A variant of such a plastics driving band for full-calibre projectiles is described, for example, in Swedish patent 7506856-9.

Nowadays, skidding plastics driving bands are generally used in respect of K-E ammunition as a powder-gas seal between the sabot and the inner side of the barrel. Hitherto, these plastics driving bands have been fitted in place by making use of the natural elasticity of the driving band material and by forcing them over the rear guide bead of the sabot and down into the specifically designed grooves in the sabot.

The fact that the driving bands had in this case to be forced over the guide beads meant that they were often subjected to a permanent deformation, since the plastics material is often more plastic than elastic. This permanent deformation results all too often in excessive play, which in turn results in a deficient seal and consequently reduced performance. The requirement is, after all, that the driving band in this type of ammunition should rotate freely within its guide groove in the sabot with the minimum possible play. In order to prevent excessive permanent deformations of the driving band,

attempts have been made to make the rear guide bead of the sabot, i.e. that guide bead in the sabot which delimits the driving band groove to the rear, with a somewhat smaller diameter than would otherwise have been made according to the collective knowledge concerning the dimensioning of such projectile parts, which knowledge has been gathered over the years on the basis of experience and calculations. It has been shown, however, that any such reduction in the outer diameter of the rear guide bead means that the powder-gas leakage reaching the driving band is then liable to increase to such an extent that the driving band has difficulty in coping with the high powder-gas pressure which has in this case been generated and which acts directly upon it, whereupon the driving band quite simply collapses.

According to the present invention, there is now instead proposed a mechanically very simple but, in an ammunition context, extremely radical move, namely that the driving band is opened by virtue of a suitably configured parting cut running transversely across its casing surface, so that it can easily be forced apart and drawn over the guide bead in question, whilst, at the same time, the latter can be fully dimensioned. Once it has been guided fully down into its groove behind the guide bead, the driving band is able to recover its original shape. It is also conceivable, following assembly, to glue or weld the driving band together along the parting cut, but, rather surprisingly, this has been shown to be unnecessary. Despite the fact that the driving band is therefore divided, including during firing, there has been shown to be no risk whatsoever of the driving band collapsing.

The parting cut may be variously configured, but obliquely placed cuts would probably be preferable, although purely axial, straight cuts might also be conceivable.

The invention has been defined in the following patent claims and will now be described in somewhat greater detail with reference to the appended figures, in

which:

- Fig. 1 shows a side projection of an arrow-type projectile prepared for fitting of the driving band, and a driving band which is ready to be fitted,
- 5 Fig. 2 shows an oblique projection of a driving band according to the invention, and
- Fig. 3 shows the finished projectile.

The complete projectile 1 shown in the figures comprises the arrow-type projectile 2 itself, which has

10 a front tip 3 and a rear fin tail unit 4. It is surrounded, in turn, by a sabot 5, which is divided along the cut 6. The various parts of the sabot 5, which are preferably not less than 3 in number, are held together by a front breaking band 7. In the rear part of the sabot

15 there is a driving band groove 8, which is surrounded on each side by a front guide bead 9 and a rear guide bead 10.

In the driving band groove 8 there will thus be fitted a driving band 11 of the type shown in Fig. 2. The

20 driving band 11 is prepared for fitting by means of its casing wall being cut through along at least one cut 13, which is preferably inclined relative to its width and which therefore opens the driving band in such a way that, in the manner indicated in Fig. 1, it can be forced

25 apart and drawn over the rear guide bead 10 and down into the specifically designed groove 8, after which the two sectional surfaces 13a and 13b respectively, by virtue of the elasticity of the material, are brought back into contact with each other, guided as they are by the edges

30 of the driving band groove 8. Once the driving band has been fitted, a check is made to ensure that it is able to rotate freely within its groove, after which the projectile is ready for delivery.

Case 3521

PATENT CLAIMS

1. Method for providing K-E projectiles (1), such as sub-calibre arrow-type projectiles (2) provided with sabots, with plastics driving bands (11) of a type which is known per se, which plastics driving bands (11), upon firing from a specifically designed barrel, seal against the inner side of the barrel and skid into a specifically matched groove in the sabot (5) of the projectile, characterized in that the plastics driving bands (11), before being fitted, are provided with at least one cut (13) running through their own casing wall, which cut (13) enables the driving band (11) to be opened and expanded, after which it is drawn in the expanded state over the one of the guide beads (10) surrounding the driving band groove (8) and down into the groove in question, after which the driving band, by virtue of the elasticity of the material, is able to recover its original shape.
2. Method according to Claim 1, characterized in that the cut (13) through the casing wall of the driving band (11) [lacuna] at an oblique angle relative to the rotational axis of the driving band coinciding with the longitudinal axis of the projectile.
3. Method according to Claim 1 or 2, characterized in that the sectional surfaces (13a, 13b) of the driving band, following assembly, are glued or welded together without thereby jeopardizing the free rotation of the driving band.
4. Skidding plastics driving band (11) for K-E ammunition (1), such as sub-calibre arrow-type projectiles (2) provided with sabots (5), which arrow-type projectiles are designed, upon firing from specifically designed barrels, to seal against the inner side of the barrel and skid against the inner side of the groove (8) made for this purpose in the respective sabot (5), designed to be fitted in the manner specified in any one of Claims 1-3, characterized in that the driving band

(11), before being fitted, is provided with at least one complete through-cut (13) which passes through its casing surface and has enabled it to be widened in connection with the assembly, and the sectional surfaces (13a, 13b) of which, after being fitted in the groove (8) of the sabot (5), are brought back into contact with each other by virtue of the natural elasticity of the material.

5 5. Skidding plastics driving band according to Claim 4, characterized in that the through-cut (13) runs
10 through its casing wall at an oblique angle relative to the rotational axis of the driving band.

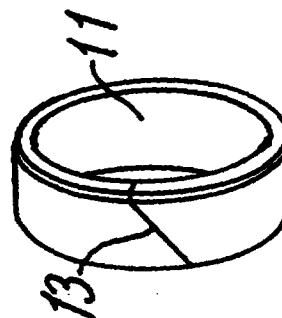
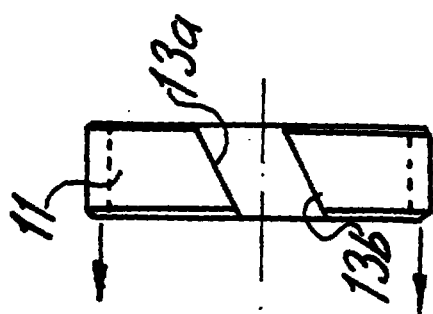


Fig. 2

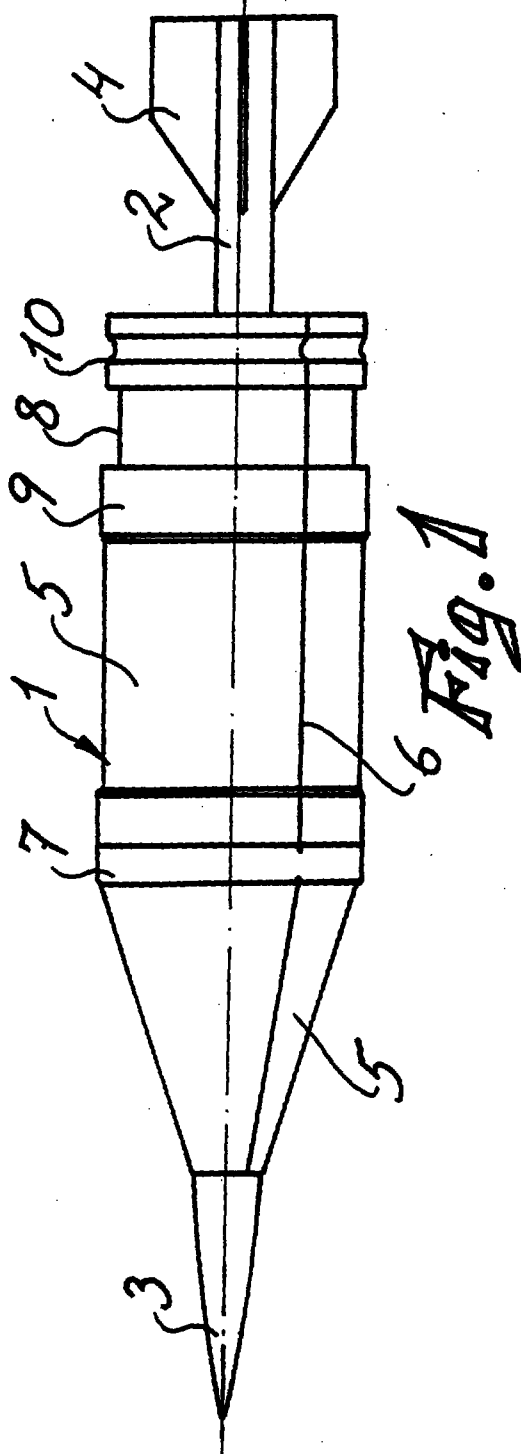


Fig. 1

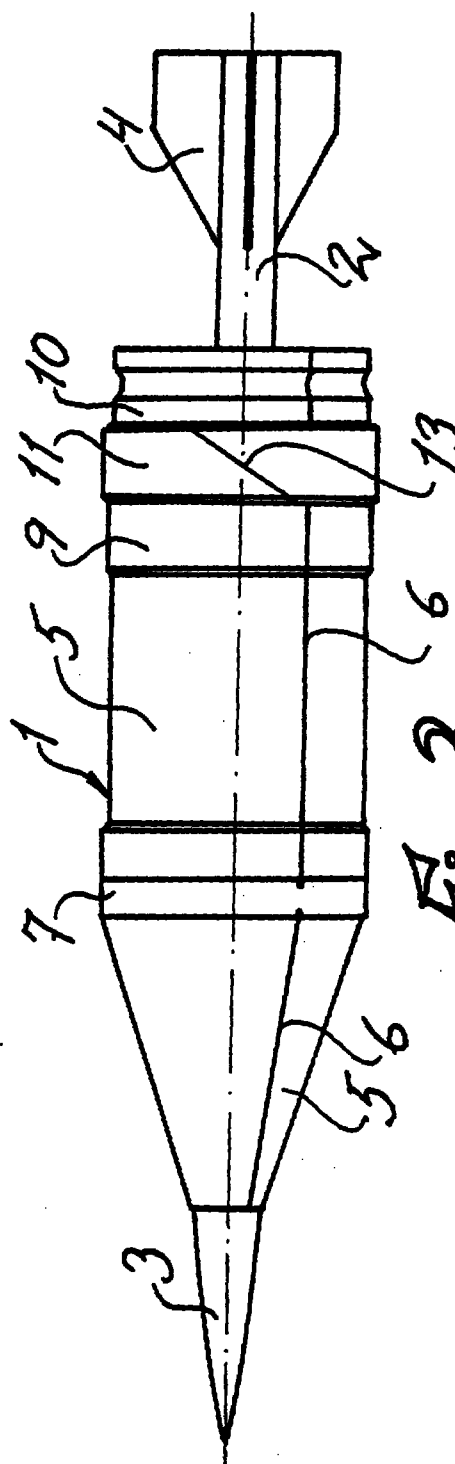


Fig. 3